Topic: Slant asymptotes

Question: How do you find the slant/oblique asymptotes of the function?

$$f(x) = \frac{x^2 - x + 1}{x + 1}$$

Answer choices:

A Set the denominator equal to 0 and solve for x.

B Perform polynomial long division.

C Set the numerator equal to 0 and solve for x.

D Take the limit as x approaches infinity.

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Solution: B

Slant asymptotes, also called oblique asymptotes, occur in rational functions (fractions) where the degree of the numerator is higher than the degree of the denominator.

To figure out whether or not the function has a slant asymptote, we can perform polynomial long division on the function.

The equation of the line that represents the slant asymptote will be the answer of the long division, not including the remainder. If there is no remainder, there is no slant asymptote.

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Topic: Slant asymptotes

Question: Find the slant/oblique asymptotes of the function.

$$f(x) = \frac{x^2 - x + 3}{x + 1}$$

Answer choices:

A $y = x + 2 + \frac{5}{x + 1}$

B $y = x + 2$

C $y = x - 2$

D $y = x - 2 + \frac{5}{x + 1}$

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Solution: C

Slant asymptotes, also called oblique asymptotes, occur in rational functions (fractions) where the degree of the numerator is higher than the degree of the denominator.

To figure out whether or not the function has a slant asymptote, we can perform polynomial long division on the function.

The equation of the line that represents the slant asymptote will be the answer of the long division, not including the remainder. If there is no remainder, there is no slant asymptote.

If we perform polynomial long division on our function, we'll set it up like this:

$$x+1 \overline{)\, x^2-x+3}$$

We'll end up with a remainder of 5, and our full solution is

$$f(x) = x - 2 + \frac{5}{x+1}$$

We remove the remainder from our result to get the equation of the slant asymptote, which is

$$y = x - 2$$

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Topic: Slant asymptotes

Question: Find the slant/oblique asymptotes of the function.

$$f(x) = \frac{x^2 + 4x + 6}{x - 2}$$

Answer choices:

A $y = x - 6 + \frac{18}{x - 2}$

B $y = x - 6$

C $y = x + 6 + \frac{18}{x - 2}$

D $y = x + 6$

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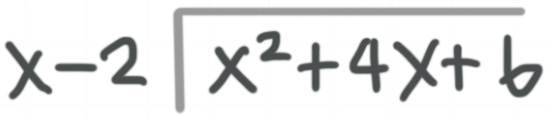
Solution: D

Slant asymptotes, also called oblique asymptotes, occur in rational functions (fractions) where the degree of the numerator is higher than the degree of the denominator.

To figure out whether or not the function has a slant asymptote, we can perform polynomial long division on the function.

The equation of the line that represents the slant asymptote will be the answer of the long division, not including the remainder. If there is no remainder, there is no slant asymptote.

If we perform polynomial long division on our function, we'll set it up like this:



We'll end up with a remainder of 18, and our full solution is

$$f(x) = x + 6 + \frac{18}{x - 2}$$

We remove the remainder from our result to get the equation of the slant asymptote, which is

$$y = x + 6$$

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